

Claims

1. Temperature sensitive polymer having a lower critical solution temperature that changes during incubation in an aqueous solution or medium,
5 which polymer is a homo or interpolymer of a hydrophobically modified hydroxyalkyl(meth)acrylamide
2. Polymer according to claim 1, wherein the polymer comprises a hydrophobic group which is bound to the hydroxyalkyl (meth)acrylamide by a hydrolysable bond, preferably by a bond selected from esters, orthoesters, amides,
10 carbonates, carbamates, anhydrides, ketals, and acetals, more preferably by an ester bond.
3. Polymer according to claim 1 or 2, wherein the hydrophobic group is selected from alkyls, aryls, lactic acid and lactic acid oligomers, preferably from lactic acid and lactic acid oligomers.
- 15 4. Polymer according to any one of the preceding claims, wherein the alkyl is selected from the group consisting of methyl, ethyl, propyl, butyl, pentyl and hexyl.
5. Polymer according to any one of the preceding claims, which polymer is a homo or interpolymer of a (N-(2-hydroxyalkyl) (meth)acrylamide lactate).
- 20 6. Polymer according to claim 5, which polymer is selected from the group consisting of homopolymers and interpolymers of (N-(2-hydroxyethyl) methacrylamide lactates) and (N-(2-hydroxyethyl) acrylamide lactates).
7. Polymer according to any one of the preceding claims, wherein the polymer comprises at least one component selected from monolactates, dilactates,
25 trilactates and tetralactates, preferably at least one of monolactate groups and dilactate groups.
8. Polymer according to any one of the preceding claims, wherein the polymer is a copolymer of (a) at least one hydroxyalkyl (meth)acrylamide

(lactate)_n, wherein n represents the number of lactate units, n being at least 3, preferably an integer of 3 to 10, more preferably 3 or 4, and (b) at least one hydroxyalkyl (meth)acrylamide (lactate)_n, wherein n is 0, 1 or 2, preferably 1 or 2.

9. Polymer according to claim 8, wherein the molar ratio of (a) is selected in the range of 0.1 to 99 %, preferably in the range of 1 to 50 %, more preferably in the range of 5 to 25 %.

10. Polymer according to any one of the preceding claims having a lower critical solution temperature before incubation below mammalian body temperature and a lower critical solution temperature after incubation above mammalian body temperature, and wherein the mammalian body temperature preferably is human body temperature.

11. A controlled release system comprising a temperature sensitive polymer according to any one of the preceding claims and an active ingredient.

12. Controlled release system according to claim 11, wherein the polymer is in the form of a polymeric micelle in which a hydrophilic block is present which hydrophilic block preferably comprises a polyalkyleneglycol, more preferably a poly(ethyleneglycol).

13. Controlled release system according to claim 11 or 12, wherein the system is in the form of a hydrogel.

14. Controlled release system according to claim 13, wherein the hydrogel is an ABA block copolymer, wherein block A is a temperature sensitive polymer according to any one of the claims 1-10 and B is a hydrophilic polymer, preferably a polyalkyleneglycol, more preferably a poly(ethyleneglycol).

15. Targeting drug composition, comprising a drug and particles of a controlled release system according to any one of the claims 11-14, which particles preferably have an average diameter of less than 200 nm more preferably in the range of 10 to 100 nm.

16. Targeting drug composition according to claim 15, which comprises a homing device.